

The suitability of a native grass species, *Microlaena stipoides*, for use as an amenity turfgrass in the Auckland region¹

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ABSTRACT

Turfgrass is an important vegetation type within the urban environment, comprising a considerable proportion of the vegetation cover in our cities. Traditionally, aggressive introduced species have been utilised for this function. However, there are native grasses which are potentially useful turf species, including *Microlaena stipoides*. The potential of *M. stipoides* as an amenity turfgrass species is evidenced by its persistence in Auckland, where it forms a naturally occurring sward in many lawns.

M. stipoides has potential as a niche turf species, due to certain characteristics:

- It is shade-tolerant, and could prove very useful as grass cover below tree plantings (where it is often difficult to establish turf)
- It is able to withstand dry conditions and low fertility, growing conditions frequently encountered in the Auckland region
- As a native species, it presents an attractive and unique option for landscape clients who are interested in native plants.

This paper presents research into the suitability of *Microlaena stipoides* as a native amenity turfgrass for Auckland, with an emphasis on its potential for the landscape trade. This includes an investigation of the distribution of the species within the region, the issues involved in cultivating it and its commercial potential.

INTRODUCTION

When we consider the preservation of New Zealand's biodiversity, amenity turfgrass must seem an unlikely environment for the advocacy of native species. Traditionally, we have sown vast tracts of aggressive introduced species, in the pursuit of a monoculture or very limited community of plants. However, there are native species that have considerable potential for use in amenity turfgrass. Of these, *Microlaena stipoides* is a particularly suitable species (Fig. 1), as proven by its presence as a naturally occurring sward in many Auckland parks and gardens. Although it has attracted attention within the turfgrass industry, it has never been introduced commercially, due mainly to difficulties with commercial propagation (as discussed by Dr Alan Stewart in these

conference proceedings). The purpose of this paper is to highlight the potential of *M. stipoides* as a 'niche' turf species for Auckland parks and gardens (as distinct from mass commercial production), as this is where its immediate potential lies. It is also important to recognise the value of the natural populations of *M. stipoides* within the Auckland region, and to conserve these better.

Microlaena stipoides (Labill.) R.Br. is a rhizomatous grass that is native to most areas of New Zealand (although more common in northern parts of the country), and is also indigenous to Australia and Malesia (Edgar & Connor 2000). It is commonly known as weeping grass or meadow rice grass. *M. stipoides* usually occurs close

¹ Editor's note: originally presented at the conference as a poster, but written in paper form for these proceedings.

to trees, under which it often forms a pure sward, in conditions that other grasses are unable to grow in. In addition to its shade tolerance, *M. stipoides* is also notable for its tolerance of low fertility and low pH (Jones & Whalley 1994). It grows year-round, and is extraordinary in its ability to regrow rapidly following periods of drought. *M. stipoides* has a distinctive appearance, due to its gracefully curved, fine leaves and the often glaucous hue of the leaves. In particularly harsh conditions (such as is found beneath certain tree species), *M. stipoides* may form a sward that only reaches 30–50 mm high. Under favourable growth conditions, it grows to 150 mm tall (with seed heads to 400 mm tall) (Aldous & Chivers 1996).

DISTRIBUTION AND PERSISTENCE WITHIN THE AUCKLAND REGION

M. stipoides is prominent on Auckland's volcanic cones. In Cornwall Park, on the slopes of One Tree Hill, it is mainly restricted to areas beneath or immediately adjacent to trees. There is often a distinct ring of pure *M. stipoides* surrounding the base of trees, to a radius of 600 mm to 2 m, which is easily discernible by its slightly glaucous, light colour. It is still present in areas of higher light, particularly along the base of fence-lines. Notably, it dominates in several higher-light areas which are not intensively managed or grazed (traditional management seems to favour aggressive exotics more than *M. stipoides*).

M. stipoides is also a significant species on and around Mt Albert. Interestingly, it is the dominant species in many private lawns and street-front berms within this area. This is particularly marked under the shade of trees, where it forms an even, attractive sward. As on One Tree Hill, *M. stipoides* thrives in situations where other species struggle (due to shade, periodic drought or a lack of fertility), so that it often forms an almost pure sward. It often grows in association with *Poa annua* in shadier situations, but the latter is not detrimental to *M. stipoides*, as it dies out in drier conditions — before returning as a winter annual (B. Christiansen pers. comm. 2003).

The natural persistence of *M. stipoides* on Auckland's volcanic cones is being used practically on Mt Eden, in the heart of the city. A community group, Friends of Maungawhau Inc., is using it as a ground cover to inhibit the regeneration of weeds in areas that they are revegetating with native plants. The idea arose from the observation that *Microlaena stipoides* forms a very dense naturally occurring sward on Tiritiri Matangi Island in the Hauraki Gulf. When early planning for the ecological restoration of the island was being made, the decision to hand-plant the island was partially necessitated by the thick cover of *M. stipoides*, which would delay natural regeneration considerably (E. Marshall pers. comm. 2003). Therefore, Friends of Maungawhau Inc. decided to use *M. stipoides* and a native herb, *Haloragis erecta*, as ground covers to suppress the regeneration of weeds, following clearance and revegetation. *H. erecta* is a highly light-dependent species, and acts as an early weed-suppressant and a nursery crop for *M. stipoides*. Plants of both species are sourced from Mt Eden, where *M. stipoides* persists in significant quantities, particularly in the shade of trees. As on Auckland's other volcanic cones, kikuyu grass (*Pennisetum clandestinum*) is a major threat to Mt Eden's natural populations of *M. stipoides*, where it supplants the native species and forms an almost pure sward over wide areas.

Amongst Auckland's other volcanic cones, I have also observed *M. stipoides* as a naturally occurring sward in private gardens on the slopes of Mt Victoria, and in gardens and street front berms around the area of Three Kings. It is also common on the coastline within the Auckland region. At Karekare beach, it still dominates in the shade of trees (from behind the secondary dunes further inland), despite the widespread presence of kikuyu grass. I have also observed it as the dominant species on hillsides receiving the full blast of salt-laden westerly winds from the Tasman Sea. *M. stipoides* also occurs in open lowland forest, open mānuka stands, and in rough pasture within the Auckland region (Edgar & Connor 2000; Wardle 1991).

CULTIVATION OF *MICROLAENA STIPOIDES*

There is little information generally available on the cultivation of *M. stipoides*, as few people have tried to actively cultivate it as a turfgrass. Ironically, it has persisted in many situations within the Auckland region due to neglect (in conditions in which other grass species struggle). Therefore, the management of the species (once established) may benefit from following an unusual paradigm for amenity turfgrass management; deliberate impoverishment of the growing environment.

When establishing a population of *M. stipoides* from seed, the area needs to be weed-free, as it is slower to establish than competing species (Aldous & Chivers 1994). Germination is staggered over a long period, and New Zealand tests yielded a germination rate of 70–75% (Way 1995). In my opinion, the best form of establishment is by planting small plants or turf sections (the latter are not yet commercially available). Although this is more expensive and labour-intensive than sowing seed, it is feasible for the production of *M. stipoides* as a high-value product.

Once established, the main problem is competition from clover and coarse grasses (Way 1995). More work needs to be done on the tolerance of *M. stipoides* to chemicals used in the control of the aforementioned weed species. However, the best way to attain a good sward of *M. stipoides* is the use of the species in situations where it is naturally superior. In this case, the natural growing conditions (such as shade or drought) act to control most competing species. If used in such situations, *M. stipoides* is an ideal low-maintenance lawn species.

Although *M. stipoides* will take very close mowing (to 25 mm in some cases), it looks better maintained at a height of 40–50 mm. It is not recommended as a species for high-traffic or intensively used areas (such as soccer fields), as it shows medium wear tolerance (Aldous & Chivers 1994).

COMMERCIAL POTENTIAL OF *MICROLAENA STIPOIDES*

The purpose of this study is to highlight the potential use of this species as an amenity turfgrass, with a particular emphasis on the landscape trade. In real terms, this equates to its commercial potential, as it must be proven to be commercially viable to stimulate widespread interest in it.

M. stipoides can fulfil an existing gap in the market as a niche product for turfgrass in shady areas. Whilst it also has potential as a general turfgrass, more research needs to be done before this can become feasible. However, as shown in the previous section on distribution, *M. stipoides* is a naturally superior species under the shade of trees, due to its tolerance of shade and low fertility (tree roots starve the soil of nutrients and water, particularly the upper layer occupied by turf). This is often evident by its presence as a pure or almost pure sward beneath trees, which in itself is a very desirable turfgrass characteristic. In addition to its natural advantage under such conditions, *M. stipoides* is not a rapid-growing species, and thus requires less mowing than other species (particularly when growing beneath the shade of trees). In addition to its use as a niche turf species for shady areas, it is a useful grass for ‘harsher, full sun environments’, such as amongst crazy paving or in other restricted spaces (Way 1995). This opens up the potential for mown lawn detailing amongst paving (a particularly difficult environment to grow plants in).

The aforementioned potential uses of *M. stipoides* are two applications for which it has significant advantages over other turfgrass species (native or exotic). They represent its immediate potential for the landscape market, and could act as a starting point for further interest in the species. If the turfgrass industry resolves the production/establishment issues for the mass production of *M. stipoides*, then its use could become more widespread. However, until that time, *M. stipoides* should have a place in Auckland’s landscape market as a high-value ‘niche’ species for turfgrass in shaded and restricted areas.

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Fig. 1 *Microlaena stipoides* lawn of George Fuller in New Plymouth. (Photo: Brian Way, NZ Sports Turf Institute).

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